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Adherence of the nursing team to patient safety actions in neonatal units

Adesão da equipe de enfermagem às ações de segurança do paciente em unidades neonatais

Adhension del equipo de enfermería a las acciones de segurad del paciente em las unidades neonatales

Léia Arcanjo Mendes[I]
ORCID: 0000-0001-5535-4728

Anna Caroline Leite Costa[I]
ORCID: 0000-0003-3236-619X

Daniela Cristina Zica Silva[I]
ORCID: 0000-0002-6872-8765

Delma Aurelia da Silva Simões[I]
ORCID: 0000-0003-0961-8213

Allana dos Reis Côrrea[I]
ORCID: 0000-0003-2208-958X

Bruna Figueiredo Manzo[I]
ORCID: 0000-0003-0064-9961

[I]*Universidade Federal de Minas Gerais. Belo Horizonte, Minas Gerais, Brazil.*

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Corresponding author:
Anna Caroline Leite Costa
E-mail: anna.leitebh@gmail.com

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ABSTRACT

Objectives: to describe the nursing team's adherence to patient safety actions in neonatal units using a validated instrument. **Methods:** a cross-sectional study, carried out through direct observation of the nursing team and descriptive analysis of 182 records of the "Checklist for patient safety in nursing care during hospitalization in Neonatal Intensive Care Units" in a hospital in the municipality of Belo Horizonte. **Results:** there was evidence of adherence greater than 90.0% in the units concerning the use of the identification wristband and guidance of the companions. It was identified 79.0% of absence on the checking of wristband identification and 59.0% of the absence of an evaluation of the crib wheels' locks. Three of the 21 items included in the checklist did not show non-conformities. **Conclusions:** partial adherence to patient safety actions was observed, especially regarding the target of patient identification and prevention of falls, which exposes newborns to preventable adverse events.
Descriptors: Patient Safety; Checklist; Neonatology; Nursing, Team; Quality of Health Care.

RESUMO

Objetivos: descrever a adesão da equipe de enfermagem às ações de segurança do paciente em unidades neonatais por meio de um instrumento validado. Método**s:** estudo transversal, realizado mediante observação direta da equipe de enfermagem e análise descritiva de 182 registros do "*Checklist* de segurança do paciente no cuidado de enfermagem na internação em Unidades de Terapia Intensiva Neonatal" em um hospital em Belo Horizonte. **Resultados:** evidenciou-se adesão maior que 90,0% nas unidades quanto ao uso da pulseira de identificação e orientação dos acompanhantes. Identificou-se 79,0% de ausência de conferência da pulseira de identificação e 59,0% de ausência de avaliação das travas das rodas do berço. Três dos 21 itens contemplados no *checklist* não apresentaram não conformidades. **Conclusões:** constatou-se adesão parcial às ações de segurança do paciente, especialmente no que tange às metas identificação do paciente e prevenção de quedas, o que expõe os neonatos a eventos adversos evitáveis.
Descritores: Segurança do Paciente; Lista de Checagem; Neonatologia; Equipe de Enfermagem; Qualidade da Assistência à Saúde.

RESUMEN

Objetivos: describirla adhesión del equipo de enfermería a las acciones de seguridad del paciente en unidades neonatales mediante un instrumento validado. Método**s:** se trata de un estudio transversal, realizado por observación directa del equipo de enfermería y el análisis descriptivo de 182 registros de la "Lista de comprobación de seguridad del paciente en el cuidado de enfermería en la internación de Unidades de Cuidados Intensivos Neonatales" en un hospital de Belo Horizonte. **Resultados:** se observó más de un 90,0% de adhesión al uso del brazalete de identificación y a la orientación de los acompañantes en las unidades. Se identificó el 79,0% de ausencia de conferencia del brazalete de identificación y el 59,0% de ausencia de evaluación de las trabas de las ruedas de la cuna. Tres de los 21 elementos contemplados en la lista de comprobación no presentaron no conformidades. **Conclusiones:** se constató una adhesión parcial a las medidas de seguridad del paciente, especialmente en lo que respecta a los objetivos de identificación del paciente y a la prevención de caídas, lo que expone a los recién nacidos a acontecimientos adversos evitables.
Descriptores: Seguridad del Paciente; Lista de Verificación; Neotalogía; Grupo de Enfermería; Calidad de la Atención de Salud.

INTRODUCTION

Patient safety, according to the World Health Organization (WHO), is described as the decreasing, to a minimum acceptable, of the risk or exposure to unnecessary danger in health care settings and is related to updated knowledge, available resources and the context in which assistance is provided[1].

The errors and complications resulting from health care that cause harm to patients are called adverse events (AE), which can be preventable and represent a great challenge for the nursing team, as they weaken the quality of health care and the safety of the patient. The occurrence of AE contributes to the increase in morbidity and mortality, the increase of hospital stay and costs, besides providing social burden and suffering to the user, his/her family and the professional who made the mistake[2]. In this sense, WHO created the World Alliance for Patient Safety in 2004, whose objective was to adopt better strategies that could result in improved patient care and, consequently, increased quality of care[3].

In 2005, with a focus on promoting the quality and safety of the care provided, WHO and the Joint Commission International (JCI) established the International Objectives for Patient Safety in the hospital environment. These objectives have been improved and currently include the following aspects: correct identification of patients, effective communication among health professionals, safety in drug administration, ensuring correct surgery in the correct place and patient, reducing infections associated with health care and, finally, decrease the grievance associated with injuries or falls[3-5].

In Brazil, patient safety became the focus of public health programs and policies in 2013, with the approval of the National Patient Safety Program of the Ministry of Health (MS), as well as the *Resolução da Diretoria Colegiada* (RDC) (Resolution of the Collegiate Board) no. 36 of the *Agência Nacional de Vigilância Sanitária* (ANVISA) (National Health Surveillance Agency), which proposed specific guidelines and actions for the patient safety[4-5]. Considering the context of obstetric and neonatal care, ANVISA proposes strategies aimed at improving the quality and safety of care for this public, intending to reduce the damage resulting from the reproductive process and minimizing the harm in the care process[6].

Neonatal units, according to regulation 930 of the Ministry of Health, are divided based on the care provided. Neonatal Intensive Care Units (NICU) are designed to care for the newborn (NB) of any gestational age classified as severe or at risk of death. The Neonatal Intermediate Care Units NINCU are of two types, among them, the Conventional Neonatal Intensive Care Units, which care for newborns considered to be of medium risk and who require continuous assistance, and the Kangaroo Neonatal Intensive Care Units, which are the units prepared to welcome the mother and the baby 24 hours a day, encouraging the practice of the Kangaroo method[7]. It is noteworthy that these scenarios are complex, as patients have great vulnerability due to low weight, early birth, hemodynamic instability and the need for frequent therapeutic interventions, which predisposes them to greater chances of adverse events[2].

In this context, it is crucial to seek to assess the actions taken by the professionals, especially the nursing team, which remains with the patient throughout their hospital stay and can be considered a barrier to the occurrence of AE. A systematic review showed that 21% of AE in neonatal units are related to skin lesions, 38% to incorrect medication dosing, 25% to accidental loss of the intravascular catheter and 20% to infections related to health care[2]. Another study, carried out in Brazil, analyzed the AEs notified to Health Surveillance Notification System and identified that 65.6% of these were related to medication, and that phlebitis, skin lesions and bruises were frequent in neonatal units[8].

Aiming to change this scenario, systems and tools that monitor and evaluate work processes and their results have been increasingly used in the care setting. These instruments and strategies have been important to direct nursing care to hospitalized NB, establish safety barriers, and provide quality of care indicators. Thus, one of the tools that contribute to patient safety is the use of checklists, since their results are optimistic for reducing errors and improving the quality of the service[9].

It is also observed that most of the studies found emphasize, mainly, the adventure of AE, not deepening the discussion about the practices and the use of validated instruments aimed at patient safety, especially concerning the evaluation of the professionals 'adherence to safe practices[6-9].

Given the above, the following question came up: What is the adherence rate of the nursing team to patient safety actions in medium and high-risk neonatal units, identified through a previously validated instrument?

The results of this study can offer health professionals and managers a diagnosis of the practices carried out, with subsequent readjustment of the work process and direction of educational strategies. They may also raise opinions and discussions applicable to the teaching, research, and nursing practice context, intended to changing paradigms related to the safety of neonatal patients.

OBJECTIVES

To describe the nursing team's adherence to patient safety actions in medium and high-risk neonatal units, using a previously validated instrument.

METHODS

Ethical aspects

This research was based on Resolution 510/2016 of the National Health Council. The risks of the research were minimal, with the benefit of the collaboration of the scientific area and the possibility of improving the problems that cause adverse events in the neonatal unit, from the research results. The project was submitted to and approved by the Research Ethics Committees of the *Universidade Federal de Minas Gerais* and the institution where the research took place.

Design, period, and study location

This is a descriptive study with a quantitative approach and cross-sectional design, guided by the STROBE tool, which is a checklist related to the essential items that must be described in an observational study[10].

The study was carried out in October and November of 2019 at the Neonatal Unit of a philanthropic hospital in the municipality of Belo Horizonte, in the state of Minas Gerais, Brazil, which is a reference in high-risk obstetric and neonatal in the municipality's *Sistema Único de Saúde*(SUS) (Unified Health System). The neonatal unit, the setting of the study, has 86 beds, of which 50 beds are for patients with NINCU profile, distributed in five different rooms; 30 beds attend patients with Conventional Neonatal Intensive Care Units profile, distributed in four different rooms; and six beds serve patients with Kangaroo Neonatal Intensive Care Units profile, arranged in the same environment.

Regarding the profile of patients attended in the studied units, premature infants prevail in the NICU, priority between 28 and 31 corrected gestational weeks, weighing more than 1500g. In Conventional Neonatal Intensive Care Units and Kangaroo Neonatal Intensive Care Units, there are usually newborns with more than 32 weeks of corrected gestational age and weight greater than 2500g. The profile of patients attended in the units studied confirms that determined by regulation 930 of the Ministry of Health, issued on May 10th of 2012, and by regulation 3389, issued on December 30th of 2013[7,11].

Sample, inclusion, and exclusion criteria

The professionals observed in the application of the checklist were nurses and nursing technicians involved in the safety actions carried out on the newborn by those who worked in the day shift. The choice for this shift was because it meets the largest number of procedures, along with the presence of companions being more frequent at this time, allowing greater applicability of the checklist in the guidance items for companions, with possible identification of non-conformities.

Professionals who, during the data collection period, were on maternity leave, on sick leave (SL) or had worked in the neonatal unit for less than six months were excluded.

Thus, 54 professionals were eligible: 14 nurses and 40 nursing technicians. However, 38 professionals from the day team participated in the study (55.8%), 6 nurses and 32 nursing technicians, who met all the inclusion criteria of the research.

To determine the number of procedures to be observed the convenience criterion was adopted due to the lack of previous studies that defined a minimum of necessary procedures for the observation of non-conformities analyzed using a validated instrument. However, the study proposed to estimate the number of patients who should be included regardless of the number of procedures they would be submitted to. In this case, a sample calculation was carried out considering a population of 150 patients over two months, a general prevalence of the event of 50%, for a confidence level of 95% and a margin of error of 5%, so that the total number of patients to be observed was calculated in 108 newborns.

The 38 eligible professionals followed 108 patients over two months of data collection. Each patient was evaluated once or twice by different professionals, for a total of 182 observation opportunities using the validated checklist, composing the sample of the present study.

Study protocol

Data were collected through participant observation, in which the collection of information takes place without the researcher's participation. So, the observation was made by a research nurse previously trained, during the seven days of the week, for about 3 to 4 hours a day, dividing her time into morning and afternoon periods. The instrument used in the research, "Checklist for patient safety in nursing care during hospitalization in Neonatal Intensive Care Units", was developed based on international patient safety objectives and all items were validated by Brazilian specialists, after reaching the Content Validity Index above 0.90, as presented in a previous study[12].

The checklist has five dimensions, which were named as: patient identification, effective communication, medication safety, prevention of infection related to health care and prevention of fall and skin lesions. The dimensions are divided into items, so that the first and the second get divided into three items, the third in four items, the fourth in five items and the last in six items. Thus, there are a total of 21 items, which evaluates the presence and checking of the identification wrist band and the bed identification, if the companion was encouraged to remain with the patient and guided about the sector's routines, newborn care plans, medication therapy, infection prevention and risk of falling. They also evaluate whether the professional is guided about the safe process of medication administration, NB positioning and body hygiene, whether alcohol solutions are at reach, whether the temperature of the crib or incubator is adequate, the quality of the dressing for venous catheter, the positioning of the devices and whether the wheels, whether the door and sides of the cribs and incubators are locked. The confirmation of the guidance items was carried out through a direct question to those involved when not observed by the researcher.

Each of these items was evaluated using the classification "compliant", "non-compliant" and "not applicable". The last one was used only in cases where the newborn did not use venous catheter devices and when the crib or incubator did not have the option of adjusting humidification and temperature.

For data collection, there was a need to make adaptations to the instrument, without interfering with its contents. The changes took place to adapt the instrument to the printed models standardized by the institution, for example: in the item identification wristband, the mother's name, and hospital record were preserved and information about the date and time of birth and sex were removed. Also, in the item bed identification label, the data evaluated were bed number, newborn's name, name of the father and mother, and two telephone numbers. Additionally, the classification "does not apply" was added in two sub-items of medication safety to meet the demands of patients who do not have venous devices.

Data collection, in turn, was preceded by meetings with the nursing team to discuss and raise awareness among professionals about the importance, purpose and methodology of this research. At this meeting, doubts about the project and the Informed Consent Form were also clarified. Then, the ICF signatures and the sociodemographic data of the professionals (age, sex, training time, professional experience and performance in the institution)

were collected, with care to safeguard anonymity, that is, prevent the professional from being identified by correlation with the data collected. After that moment, the researcher evaluated whether the actions taken by the nursing team were in line with the items proposed by the checklist and with its instructions.

Analysis of results and statistics

The data found were typed and analyzed using the statistical software Statistical Package for the Social Sciences (SPSS®) version 22.0. Categorical variables were presented using absolute and relative frequencies. For the quantitative variables, measures of central tendency (median) and dispersion measures (minimum-maximum) were determined, after application of the Kolmogorov-Smirnov normality test.

RESULTS

During the study period, a total of 182 "Checklist for patient safety in nursing care during hospitalization in Neonatal Intensive Care Units" records were filled in, related to 108 patients. Among which, 121 were filled based on care provided by NINCU and 61 by NICU.

All participating professionals were female, with 6 nurses (16.0%) and 32 nursing technicians (84.0%). Age ranged from 20 years old to 46 years old, with a median of 32 years old. As for training time, the minimum was 7 months and the maximum 18 years, with a median of 3 and half years. The length of experience ranged from 6 months to 17 years, with a median of 2 and a half years. And the length of experience at the institution ranged from 6 months to 17 years, also with a median of 2 years. The results concerning the assessment of the adherence to neonatal patient safety actions, according to the checklist, are shown in Table 1, according to the units assessed.

The table above shows the data collected on nursing professionals 'adherence to patient safety actions, considering each checklist evaluation item. When checking each of the 21 items, only three of them did not identify non-conformities, which shows weakness in the safety of the patient admitted to the neonatal unit.

Table 1. Frequency of adherence by nursing professionals concerning neonatal patient safety actions, according to the hospitalization in the neonatal unit, from October 2019 to November 2019, Belo Horizonte, Minas Gerais, Brazil, (N=182)

Observed items	NICU		NINCU	
	n	%	*n*	%
Patient identification				
Wristband affixed to one of the lower limbs, preferably having the mother's name and hospital registration number, legible.				
Yes	109	90.1	61	100
No	12	9.9	-	-
Total	121	100	61	100
Data on the newborn's wristband checked with maternal data by double-checking with the father, or a companion or other health professional (in the absence of the father).				
Yes	25	20.7	5	8.2
No	96	79.3	56	91.8
Total	121	100	61	100
Bed identification label with the bed number, newborn's name and mother's name.				
Yes	83	68.6	60	98.4
No	38	31.4	1	1.6
Total	121	100	61	100
Effective communication				
Companion instructed with accessible language concerning the unit's routine and an indication of hospitalization.				
Yes	109	90.1	57	93.4
No	12	9.9	4	6.6
Total	121	100	61	100
Companion encouraged to be beside the newborn.				
Yes	110	90.9	58	95.1
No	11	9.1	3	4.9
Total	121	100	61	100
Companion instructed about the care plan proposed for the newborn.				
Yes	106	87.6	57	93.4
No	15	12.4	4	6.6
Total	121	100	61	100
Medication safety				
Nursing professional instructed on the safe process of medication administration.				
Yes	121	100	61	100
Total	121	100	61	100
Vascular catheters identified with the corresponding solution to the infusion and adjusted connectors.				
Yes	74	61.2	-	-
No	43	35.5	3	4.9
Not applicable	4	3.3	58	95.1
Total	121	100	61	100
Infusion pumps and checked solution labels.				
Yes	78	64.5	2	3.3
No	-	-	1	1.6
Not applicable	43	35.5	58	95.1
Total	121	100	61	100
Companion instructed about the medication therapy in use.				
Yes	92	76	51	83.6
No	29	24	10	16.4
Total	121	100	61	100
Infection prevention				
Nursing professionals aware of information about infection prevention related to health care.				
Yes	121	100	61	100
Total	121	100	61	100
70% alcohol solution available at the bedside.				
Yes	119	98.4	61	100
No	2	1.6	-	-
Total	121	100	61	100
Companion instructed about the risk of infection.				
Yes	104	85.9	53	86.9
No	17	14.1	8	13.1
Total	121	100	61	100
Temperature and humidification of the incubator or crib suitable for gestational age and the newborn's need.				
Yes	115	95	29	47.6
No	6	5	1	1.6
Not applicable	-	-	31	50.8
Total	121	100	61	100
Clean and well-adhered dressing.				
Yes	61	50.4	6	9.8
No	21	17.4	-	-
Not applicable	39	32.2	55	90.2
Total	121	100	61	100

To be continued

Table 1 (concluded)

Observed items	NICU		NINCU	
	n	%	*n*	%
Fall and injury prevention				
Crib or incubators wheels locked.				
Yes	35	28.9	11	18
No	86	71.1	36	59
Not applicable	-	-	14	23
Total	121	100	61	100
Heated crib sides or locked doors.				
Yes	91	75.2	29	47.5
No	30	24.8	20	32.8
Not applicable	-	-	12	19.7
Total	121	100	61	100
Companion instructed concerning NB fall prevention measures.				
Yes	39	32.2	42	68.9
No	82	67.8	19	31.1
Total	121	100	61	100
Gastric tube and vascular device, ventilatory and/or monitoring devices positioned and fixed to prevent injuries.				
Yes	83	68.6	52	85.3
No	38	31.4	-	-
Not applicable	-	-	9	14.7
Total	121	100	61	100
Nursing professionals are instructed on the NB's positioning, including the frequency of change in decubitus/pressure relief according to the clinical condition.				
Yes	121	100	61	100
Total	121	100	61	100
Nursing professional instructed about the type and frequency of body hygiene.				
Yes	121	100	61	100
Total	121	100	61	100

Note: NICU - Neonatal Intensive Care Units, Neonatal Intermediate Care Unit–NINCU.

DISCUSSION

The results found in this study allowed identifying the strengths and weaknesses of the nursing team concerning actions to encourage patient safety in the studied neonatal units. The data reveal a higher percentage of adherence to the correct use of the patient's identification wristband, availability of alcohol solutions at the bedside, instruction to the companion on the unit's routine and an indication of hospitalization, and the encouragement to stay with the patient. On the other hand, there was a lack in safety actions in some items, such as guidance to companions regarding the risk of falling, besides partial adherence to measures such as checking the data on the wristband, locking the wheels of the cribs and incubators and the neatness of the dressing of venous catheter.

The frequency of adherence to the use of the patient identification wrist band showed in the results was higher than that found in a study developed at a NICU in the state of Rio de Janeiro, Brazil, which was 77.5%. In this study, the authors emphasized that professionals do not have the habit of checking the wrist band information, its neatness and readability, besides not checking this information before performing the nursing procedures, for example, before giving medications[13]. Another study evidenced that even when newborns were using the wrist band, in 80,9% of the observations there was no checking of the identification wristband before the procedures were carried out[14].

Research carried out in Boston showed that, during 186 days of care provided to 1260 newborns, the risk of errors related to the identification of patients in the NICU ranged from 20.6% to 72.9%, and the most common causes were similarities among names, identical surnames, presence of twins and triplets[15]. Therefore, it is reinforced that the identification wristband constitutes a barrier for other AEs, besides being an accessible and easy to use option. Thus, the absence of checking the identification wristband represents a break in safe care, exposing the newborn to the risk of AE. Therefore, there needs to be a change in the attitude of professionals, to correctly and more frequently check the data on the wristband, besides checking its effective use[13].

Concerning the use of the identification label in the patient's bed, the data from this study showed better results in the NINCU than in the NICU. A survey carried out in southern Brazil with 96 patients admitted to a pediatric ICU revealed that the majority (98%) had an identification labels close to the bed. The use of the identification label in this location is important, however, it must be associated with other identification methods, since it does not accompany the patient during escorting within the hospital or changing beds, which can end in AE[16].

As for effective communication, the results of this study show that professionals guide companions about the unit's routine and reasons for hospitalization, besides encouraging their stay with the NB in both units. However, guidance to companions included in the other items showed weaknesses, including medication therapy in use and measures to prevent falls, which have lower adherence rates, especially in the NICU. It is inferred, therefore, that the companions were not adequately advised on how they could participate in safe patient care with professionals and the need to improve communication between professionals and companions is emphasized.

An integrative review published in the year 2019 suggests that a family hosted from the first minute of hospitalization, and encouraged to participate in therapeutic proposals and patient safety actions with professionals, can benefit the clinical improvement of the patient, decrease the hospitalization time and, consequently, the incidence of AE[17].

Still concerning the participation of the family in patient safety, a study concludes that the presence of parents or companions is a little-explored resource and warns that the family is considered potentially ready, willing and able to be an active partner in improving the safety of the patient in the NICU and the prevention of adverse events[16]. An effective hosting, through guidelines with accessible language and in a simple way, provides many benefits for the family and for the NB, including the strengthening of the professional-patient bond, the ability to listen and the engagement of family members in patient safety[18].

During the newborn's hospitalization, companions can contribute to the prevention of AE in the medication administration process, by checking the patient's identification and monitoring the professionals' hand hygiene, becoming important performers in patient safety[18]. Thus, the companion must be invited and encouraged to share observations and doubts, besides participating in safety actions along with health professionals.

Medication-related errors take place with great frequency in health institutions, and there is a relationship between these

incidents with distractions and lack of information[2,8,19]. Studies highlight the following factors related to safety in fluid therapy: attention, caution and concentration in the preparation of medication, which must happen in an environment with adequate light and that promotes noise reduction, either by signposts or by physical area limitation. It is also worth noting the need to double-check the prescription and use internal tables or protocols that regard drug compatibility and stability[20].

After being prepared, the medications must be identified with the clear name of the medication, date and time of preparation, also to the name of the person who prepared it, to avoid accidental exchange and enable the verification of medication stability. Still, infusion pumps must be identified according to the current therapy, and the solutions must have labels that specify their composition and infusion rate. The venous line connections must respect the order of drip speed. Special attention should be addressed to newborns using various medications. Finally, equipment, connectors and three ways must be dated and within the validity indicated by the institution[20-21]. Thus, measures to promote medication safety are established, covering the actions recommended by the protocols of the Ministry of Health. Such actions, however, do not grant that the error will not happen, but they tend to prevent it from happening[22]. The strategies for identifying the vascular catheters with the solution corresponding to the infusion, including checking the programming of the infusion pumps and the labels of the infused solutions, when they have low adherence, are correlated with the increased chances of an error happening[19,23].

As for health education, in this study, all nursing professionals were guided through training and continuing education provided by the institution participating in the research. The education of nursing professionals is a protective factor in promoting patient safety, due to the transmission of information and the presentation of strategies for improving care practice[19]. However, it is observed, from the other results of this study, as the integrity of the catheter dressing and the locking of the sides of the heated cribs and doors of the incubators, that besides the education of nursing professionals, other strategies for improving care are necessary to incorporate the development of safe practices. In this sense, it is clear that the participation of the health team and the commitment of managers are essential for the use of current scientific evidence and the implementation of protocols in health settings[19].

Several factors influence the NB to infections, such as weight, gestational age, the fragility of the skin, the immaturity of the immune system, the physiology, and the number of procedures. It is known that healthcare-related infection directly interferes with newborn mortality rates[24]. In this study, when analyzing the items related to infection prevention, it is observed that alcohol solutions were available at the bedside. Its availability is related to greater adherence to hand hygiene and disinfection of surfaces and connections of venous catheters, which contributes to the prevention of infections related to health care[25].

It was also found that the temperature and humidification of the incubators were adequate for the newborn's needs. This is an important measure, since thermoregulation is a protective factor against infections and hypoxia, especially in premature newborns[26].

In contrast, in the results of the other infection prevention items, less adherence was identified in those related to the integrity of the venous catheter dressings. It is known that its quality is a worrying factor in the care provided to the NB, given that the location can become a culture environment for microorganisms, leading to blood contamination and, consequently, increasing infections. Primary bloodstream infection is one of the most prevalent complications in the NICU, with gram-negative bacteria as the main biological agent, which are highly resistant to medication therapy and whose main contamination agent is the central venous catheter[27].

Thus, it is essential that the health team effectively performs the venous care, including the daily evaluation to keep the catheter, check the integrity and clean the dressing, besides monitoring the signs of infection. The importance of ensuring the implementation of simple and low-cost preventive measures, such as hand hygiene, maintenance of aseptic techniques in invasive procedures, and disinfection of materials and surfaces[24] is also emphasized.

Concerning the observation of items related to fall prevention, it was found that some cribs and incubators' wheels were broken or rusty, also there were no upper rails and doors, on top of having crib sides reinforced with adhesive tape due to locks wear out. There was also a significant frequency of non-conformities, in both study units, in the item corresponding to the companion's guidance regarding the risk of NB falling. This finding, which results most significantly in the NINCU, indicates an increase in this risk for hospitalized neonates. The doors, sides and wheels of the cribs and incubators should be assessed continuously, especially after routine procedures, since the moving of the NB may cause falls[28].

One of the factors that intensify the risk of NB falling is the inadequate opening and/or closing the incubator or crib, both for the administration of medicines and the exchange of solutions and the adjustment of the airway devices, weighing and NB handling. It should be noted that this can be performed by the health team or by the parents. Also, the transfer of the newborn to another incubator or crib, or its improper functioning, such as the moving of the newborn to perform kangaroo care, are situations that cause a risk of falling[29-30].

The identification of care risk factors allows the implementation of intervention and monitoring strategies, establishing barriers, guaranteeing the quality of care provided to the individual and reducing AE. An important and effective intervention is the education of professionals and family members concerning the risk of falling, as it allows the early identification of situations that intensify this risk, so that the NB receives rigorous and planned attention in their bed[31]. Additionally, preventive and corrective maintenance of hospital equipment is essential and helps to minimize this risk.

As for the items related to the prevention of skin injury, all professionals were informed about the need to change the NB's decubitus position and about the type and frequency of body hygiene appropriate to the patient's condition. However, there was a significant frequency of non-conformities in the NICU concerning the fixation of assistance devices. It is known that technological advances in the health area were crucial for increasing the survival of NB who require intensive care. Nevertheless,

many technologies and major interventions for this care require the use of medical devices, which, in turn, can cause skin lesions when poorly positioned. Moreover, other factors constitute a risk for the event of injuries, such as the NB's skin fragility, friction, shear and immobility[32]. To avoid complications, AE and worsening of the clinical condition, it is important that the assistance team is instructed and correctly positions the patient and the assistive devices. It is noteworthy that AEs can prolong the hospital stay and lead the patient to death[3].

Study limitations

It is considered as a limitation of this study the possibility of intentional change of attitude on the part of the professionals, as they are aware that they could be observed during their practice. To avoid this behavior, the researcher sought to have the greatest discretion when evaluating. Furthermore, the study was carried out in a single setting, and the night shift was excluded fromthe evaluation.

Contributions to the area

The presented results suggest the feasibility and usefulness of the practical application, in neonatal units, from an instrument built and validated for patient safety in nursing care. Therefore, the study contributes to the identification of the nursing team's strengths and weaknesses concerning safety actions and raises reflections about strategies capable of strengthening patient safety. Also, it can foster applicable discussions in the context of teaching, research, and nursing practice.

These findings may help professionals and managers to look for new training strategies and restructuring the work process, to ensure safer practices. Furthermore, this research can support the inclusion of essential elements in the training curricula of the technical and higher education in nursing, aimed at favoring the growth of the patient safety culture.

CONCLUSIONS

The study allowed to identify the frequency of the nursing team's adherence to patient safety actions in neonatal units, using a previously validated instrument. The items that showed the highest frequency of adherence were related to the use of an identification wristband and provision of guidance to companions. On the other hand, checking the wristband and evaluating the locking of the wheels of the cribs and incubators showed the lowest compliance rates, which exposes newborns to preventable adverse events.

The methodology used enabled the knowledge of the strategies that contribute to patient safety, according to international objectives, also the identification of the weaknesses of the service, which can lead to AE. Additionally, the results showed can support intervention strategies, considering that adverse events can be avoided.

It is concluded that the "Checklist for patient safety in nursing care during hospitalization in Neonatal Intensive Care Units" can be applied in healthcare practice and offer subsidies for the development of a situational diagnosis, contributing to the planning and development of strategies capable of increasing patient safety.

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